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Futures of Deepfake and Society: Myths, Metaphors, and Future Implications for a Trustworthy Digital Future

Abdul Wahab

Abstract

The revolutionizing journey of technology has traveled so far from simple Artificial intelligence to advanced Machine learning using deep learning algorithms. These algorithms generate high-level realistic content, either audio or video, that is indistinguishable from human cognition, known as Deepfake. Deepfake technology jeopardized the quality of information and trust in society. Therefore, this study aims to explore and uncover the hidden myths, metaphors, worldviews, and societal systematic causes of deepfake technology and identify the potential risk reduction strategies from a strategic foresight perspective using Causal Layered Analysis (CLA). This was achieved by the qualitative review of statistical data conducted at the mass level and case studies related to the current and future implications of deepfake across various societal domains. Our findings reveal that Deepfake technology erodes trust in digital media, causing suicides due to psychological distress while presenting risks and opportunities. Based on CLA outcomes, future recommendations are formulated to minimize deepfake creation and the victimization process. Also, increased awareness, regulation, and education are essential to mitigate its negative impacts and harness its benefits. However, the technology also presents opportunities for positive applications in education and entertainment. The results underscore the need for enhanced media literacy and regulatory frameworks to address the challenges posed by deepfakes while harnessing their potential benefits. Potential Future research should focus on developing effective detection methods and public awareness campaigns.

Keywords: Deepfake, Generative-AI, Causal Layered Analysis, Technology Foresight, Strategic Foresight, Futures Studies

1 INTRODUCTION

Artificial intelligence (AI) and digital media are experiencing a revolutionary era amid a continually growing technical dynamism (Hussain, 2024). Deepfake technology is one of the best examples of this technological revolution (Passos et al., 2024). Because of realistic video generation, it has become difficult for people to identify the difference between real and fake (Pink, 2022). This is characteristic of the digital transformation cup of emergence, which has fully developed algorithms and machine learning technologies that have made it easier to create incredibly realistic audiovisual material that is hard to tell apart from reality (Habgood-Coote, 2023; Zaidi, 2020).

The history of AI media manipulation can be explained in various stages. People initially started using simple editing software, but now sophisticated deepfakes are based on AI algorithms that leverage thousands of data sets and deep neural networks (Zhang, 2022). This technological genealogy also shows the exponential growth of machine learning, making it possible to create content that can easily fool even the most patient audience (Casu et al., 2024). As the much-debated future of deepfake technology blossoms, it raises critical, societally relevant questions that must be solved (Priya et al., 2024).

Deepfake technology uses artificial intelligence to produce synthetic videos or audio that are indistinguishable from reality; based on it, AI can dramatically affect societal interaction and information sharing (Chadha et al., 2021). However, it also creates several multifaceted problems unimagined earlier, with the increasing potential of generating fake news and Graphic Accounts of Identity on the World Wide Web (Agarwal & Farid, 2021; Ben Aissa et al., 2023). However, the importance of deepfakes is not limited to fun and entertainment (Hussain, 2024); they are severely aimed at the foundations of trust in any digital exchange and bring several ethical issues related to consent and representation (Rathi et al., 2024). As such, and based on the potential capabilities of deepfake technology, there is a direct need to comprehend the implications of the technology adequately; hence, there is a call for early strategic foresight in managing this current and potent technological reality (Kieslich et al., 2024).

Deepfake is a highly emerging delusional technology full of threats and fewer opportunities (Diakopoulos & Johnson, 2021). Despite the rapid deepfake, technological advancement and its availability bring the world on the brink of fear of deception, chaos of misinformation, and misery, which has led people to death (Al-Nimr, 2024). The intuitiveness of trade tools for creating Deepfakes has stretched the multidimensional gap between governance and technology (Pink, 2022). Deepfake delusional aspect transformed the term “seeing is believing” into “Seeing is Deceiving” (Weikmann & Lecheler, 2023). A large number of the population, especially celebrities, girls, women, politicians,

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public figures, journalists, businesses, corporate executives, Human Rights activists, educators, influencers, legal professionals, individuals in relationships, and everyday internet users from every sector, are all threatened by deepfake technology (Mankoo, 2023).

The future is unpredictable because it is a mixture of complex scenarios. At the same time, Futures Studies is a systematic study of past and present to uncover the hidden myths and metaphors related to these complexities for possible alternative futures (Inayatullah, 2004). Sohail Inayatullah theorized the six pillars/stages of futures studies which are executed from mapping, to transforming the future (Inayatullah, 2008). Each stage requires a set of future study methods, tools, and approaches, and causal-layered analysis (CLA) is one method used to deepen the future (Inayatullah, 2013).

To analyze the complex nature and uncover all the factors of deepfake technology, this study utilizes the Causal Layered Analysis (CLA) as a methodology—the heuristic four-layered framework designed by Sohail Inayatullah in 1998 (Inayatullah, 1998). The litany, systemic causes, worldview, and myth/metaphor are the four building blocks or layers of the CLA. It is a transformative Futures Studies methodology with a strategic foresight approach that allows an in-depth exploration of the societal problems, causes, and proportional aspects associated with deepfake technology (Inayatullah et al., 2022). The layered approach is widely used to explore various fields to uncover problems and transform the current issue into an actionable solution (Wahab, 2024).

The main objective of this interdisciplinary research is to (1) incorporate the multi-dimensional impacts of deepfake technology into CLA, (2) reveal various associated emerging risks and opportunities from the Futures Studies perspective, (3) develop strategic insights for policymakers and stakeholders, (4) bridge the gap between technological assessment and social impact analysis, and (5) provide a first-ever in-depth strategic foresight of deepfake technology. The outcomes will extend understanding of the technological disruption, questioning the current impact analysis approaches and provide actionable insights. These actionable insights will be beneficial for a significant number of deepfake stakeholders, including but not limited to policymakers, technology developers, media organizations, educational institutions, and ethical technology governance bodies.

As we traverse these layers, we will see how the immediate threat and our deeper social and worldview narratives shape deepfakes. The results will emphasize the necessity of proactive measures, regulation, and a coordinated response to Technology Management Transformation (TMT). The following sections will unfold this through the lens of CLA, looking to current research, real-world case studies, and expert insights to explore layers of deep fake technology, its many ramifications, and future possibilities.

2 OVERVIEW OF DEEPFAKE TECHNOLOGY

Deepfake technology is based on Artificial Intelligence (AI) deep learning algorithms. The term “deepfake” was first identified in 2017 on Reddit. Since then, deepfakes have also come into focus as both a creative application and a malicious one (Altuncu et al., 2024; Ashifur Rahman et al., 2022). One of the earliest examples of deepfake technology predates the term, which appeared in 1997 when researchers worked on arranging lips in video footage with a different audio track, creating a loose lip sync deepfake (Agarwal & Farid, 2021; Zhang, 2022). The rapid advancement of deepfake technology has made it increasingly difficult to distinguish between real and fake content, raising concerns about its impact on various aspects of society (Matli, 2024). The number of deepfake videos online has exploded, growing by 968% between 2018 and 2020, and by 2024, there were over 10,000 tools available for deepfake generation (Altuncu et al., 2024).

2.1 From Lip-Sync to Hyperrealism: A Narrative of Deepfake Creation

Technology has taken decades to achieve maturity (Voulodimos et al., 2018), from lip-sync to hyper-realistic fake video. Deepfake took a big leap forward, mainly with the advent of a subfield of machine learning known as deep learning with advanced deep learning algorithms such as GANs and autoencoders. Fake has become the dominant force behind making even more realistic deepfakes (Saxena & Cao, 2022). During the creation process, there is an ongoing battle between the generator and the discriminator, as these are the core elements of the creation of deepfake (Lee et al., 2022). The generator produces synthetic data, like a deepfake image or video, while the discriminator acts as a judge who tries to authenticate data. The generator has to work even harder due to this act-and-react, producing deepfakes that are tougher to spot. Autoencoders provide another approach. Imagine a sophisticated data compression and decompression system when discussing the autoencoders (Figueira & Vaz, 2022). In addition to GAN and autoencoder, face swap involves modeling or warping one face with another in a video where the individual in the

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video wanted was not available or the video needed improvement. Face reenactment aims for expression matching to match a given reference person or a specific sequence, while attribute manipulation changes parameters such as hair color, age, or emotion (Figueira & Vaz, 2022). Talking face generation extends the method, using audio signals to synchronize still images into moving images of a person saying things they never actually said (Mary & Edison, 2023). The democratizing access to deepfake is the reason for leveraging various deep learning techniques and tools. Open-source tools like *DeepFaceLab* for face swapping and *DeepSwap* for synthetic content generate deepfakes effortlessly. Also, *FaceApp* or *Reface* is a real-time face-changing application that makes deepfake creation available on smartphones (Liu et al., 2023; Xu et al., 2022). With the advancement and improvements in deep learning algorithms, the results of deepfake-generated content are continuously evolving to be more accurate. At the same time, the demand for increased computational power and the growing availability of large datasets have also increased. The current deepfake models can provide seamless real-time video and audio conference-level conversation, potentially threatening society.

2.2 Deepfake Creation Process

Figure 1 illustrates the deepfake creation process with varying phases and approaches. The process has several levels, from the date information is collected to the deployment of the content. Each step utilizes Machine Learning (ML) techniques, tools, and applications(Altuncu et al., 2024). This process is primarily driven by Generative Adversarial Networks (GANs), which facilitate the synthesis of realistic media (Pink, 2022).

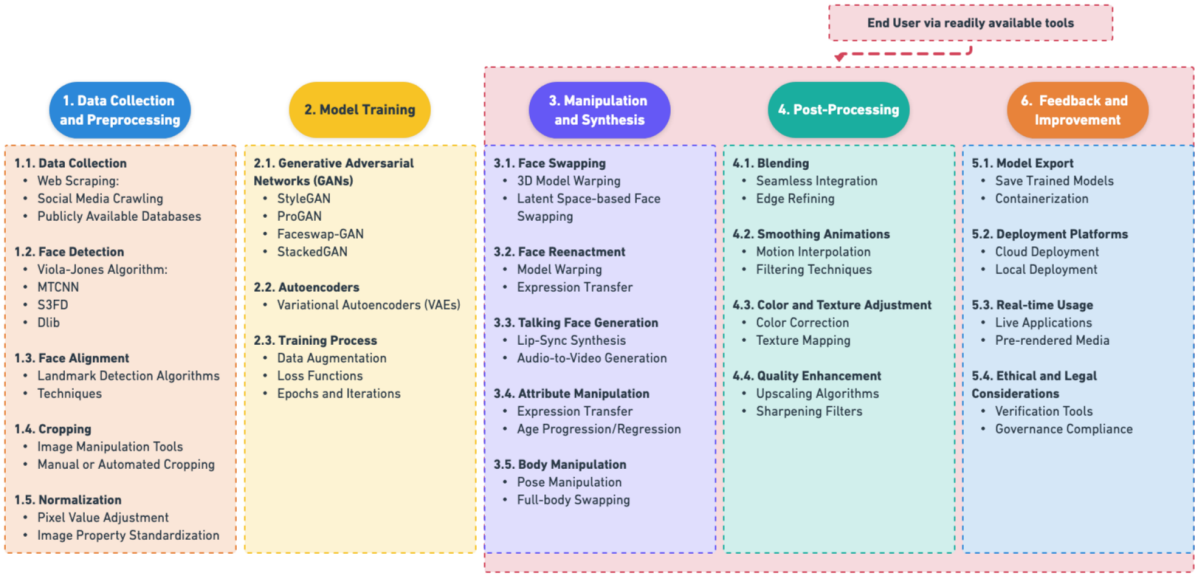

Figure 1: *Deepfake Stages, Techniques and Tools (By Author)*

2.3 Deepfake: Trends, Impacts, and Rise Across Sectors

Deepfake technology has diverse positive and negative influences (Altuncu et al., 2024). However, current trends present more threats in almost every industry than benefits (Zaidi, 2020). The adverse effects of deepfake platforms threaten to erode trust in information, degrade public discourse, and deepen existing societal disparities (Eller, 2023; Habgood-Coote, 2023). Given the high growth potential of deepfake technology, the issues of diagnosing and addressing the risks of its misapplication will only grow in the future (Chauhan, 2024). The synthetic nature of deepfake has posed a bad impression compared to its positive applications (Saxena & Cao, 2022). The overwhelming impact has threatened all societal fields, sectors, and factors except the entertainment industry (Casu et al., 2024). None of the other technologies has threatened to undermine trust in information, erode public discourse, and exacerbate existing societal divisions except deepfake technology (Langguth et al., 2021). As it evolves, people are getting more concerned about its harmful nature, as it is the weapon of mass disinformation and deception, which

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could be worse than any nuclear weapon (Rathi et al., 2024). **Table 1** provides an overview of the positive and negative trends in deepfake technology.

Table 1 *overview of the trends with positive and negative impacts of deepfake technology.*

Field	Trend	Positive Impact	Negative Impact
Entertainment	Increasingly prevalent in the entertainment industry, used to enhance visual effects, create digital avatars, and revive deceased actors (Chauhan, 2024).	Create more realistic and immersive experiences for audiences, pushing the boundaries of creative expression and storytelling (Chauhan, 2024; Rathi et al., 2024).	Ethical concerns arise when deepfakes are used without consent, particularly when reviving deceased actors or manipulating the likeness of living individuals (Chauhan, 2024; Hoek et al., 2024).
Education	Potential to personalize learning experiences, create interactive historical simulations, and enable language learning through realistic scenarios (Chauhan, 2024; Matli, 2024; Rathi et al., 2024).	Make learning more engaging and accessible, tailoring content to individual needs and providing immersive experiences that enhance understanding (Chauhan, 2024; Lowenstein et al., 2024; Rathi et al., 2024).	Raises concerns about the potential for misinformation and the need to ensure responsible use and clear distinctions between real and fabricated content (Ashifur Rahman et al., 2022; Hoek et al., 2024; Passos et al., 2024)
Healthcare	Medical training, generating synthetic medical images, and providing personalized health information through digital avatars (Chauhan, 2024; Navarro Martínez et al., 2024).	Realistic simulations for medical training, improve patient engagement, and enhance the accuracy of medical diagnoses through the use of synthetic data (Lowenstein et al., 2024).	Ethical considerations are paramount when using deepfakes in healthcare, ensuring patient privacy, data security, and responsible use to prevent misdiagnosis or the spread of misinformation (Chauhan, 2024; Navarro Martínez et al., 2024)
Politics	Pose significant risks in the political sphere, enabling the spread of misinformation, manipulation of public opinion, and interference in elections (Chauhan, 2024; Łabuz & Nehring, 2024)	There is not a single positive impact on political sector. (Atlam et al., 2025; Łabuz & Nehring, 2024; Passos et al., 2024).	Erosion of trust in political figures, undermine democratic processes, and exacerbate social divisions by spreading false or misleading information (Altuncu et al., 2024; Ashifur Rahman et al., 2022; Łabuz & Nehring, 2024; Navarro Martínez et al., 2024).
Cybersecurity	An emerging threat in cybersecurity, enabling sophisticated phishing attacks, identity theft, and financial fraud (N. Kumar & Kundu, 2024; R. Kumar et al., 2024)	The development of deepfake detection technologies is driving innovation in cybersecurity, leading to the development of more robust authentication and security measures (R. Kumar et al., 2024; Rathi et al., 2024; Sudhakar & Shanthi, 2023).	Make it increasingly difficult to verify the authenticity of online content, potentially leading to financial losses, reputational damage, and the erosion of trust in digital systems (R. Kumar et al., 2024; Rathi et al., 2024; Sudhakar & Shanthi, 2023).
Social Media	Prevalent on social media platforms, often used to spread misinformation, create non-consensual pornography, and manipulate public opinion (Ashifur Rahman et al., 2022; Atlam et al., 2025; Łabuz & Nehring, 2024).	There is not a single positive impact on politics sector. (Łabuz & Nehring, 2024)	Contribute to the spread of harmful content, erode trust in online information, and amplify the negative consequences of online harassment and bullying (Ashifur Rahman et al., 2022; Chauhan, 2024; Łabuz & Nehring, 2024).

The above information is limited to the extent of certain studies; however, the potential list is a bit extensive if included. It aims to provide a comprehensive overview of the current state of deepfake, highlighting key trends, positive and negative impacts, and the need for ongoing research and collaboration to mitigate the risks posed by this evolving technology. Unearthing the myths and metaphors related to deepfake requires an extensive approach, which is why CLA is utilized.

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3 METHODOLOGY

3.1 Causal Layered Analysis

Causal Layered Analysis (CLA), a transformative research methodology for exploring and shaping the future, was developed by Sohail Inayatullah in the early 1990s. It was officially published in 1998. CLA aims not to predict the future but to open possibilities and generate transformative change. It achieves this by examining issues through four interconnected layers beyond the superficial analysis (Inayatullah, 1998, 2004). The execution of the method begins with the first layer, known as the litany layer, which analyzes the current problems at the surface level by observing trends, data, facts, and all the visible aspects of the problem. Next, it traverses to the second layer, systematic causes; CLA facilitates the examination of surface-level symptoms, systemic causes, prevailing worldviews, and the metaphorical narratives that shape our understanding of this phenomenon. The third worldview/Discourse layer delves into the underlying ideologies, beliefs, and assumptions that shape society's perspective about the situation. The last and fourth layers are the deepest layers, which analyze and explore the meaning of the myths, metaphors, archetypes, stories, and symbols related to the context. CLA moves from the visible to the invisible, from the surface to the depths, to reveal the underlying assumptions and narratives that shape our understanding of the world and influence our actions. This layered approach helps uncover the complexities hidden beneath surface observations, explore systemic structures, question underlying worldviews, and reveal the metaphorical narratives that influence our perception of change (Inayatullah, 1998, 2009).

Since its inception, CLA has evolved significantly, transitioning from an experimental methodology to a prominent method in Futures Studies. This metaphorical representation highlights the growth and expansion of CLA in its application and influence. It has been applied in over fifty areas, including agriculture, Sustainability, Aviation, Bioethics, Business Ecosystem, Business Marketing and Branding, Community Development Accountability, Cultural Studies, and many more. This wide range of applications demonstrates CLA's versatility and capacity to provide valuable insights into diverse and complex issues. (Wahab, 2024) Among various key Strengths and Practical Implications, CLA's strength lies in its ability to go beyond surface-level analysis and engage in more profound and nuanced discussions. CLA helps unveil the often-unconscious beliefs, experiences, and emotions that shape our understanding of an issue. CLA facilitates a transformative approach that considers alternative futures and develops strategies for achieving desired outcomes (Inayatullah, 2004).

3.1.1 Justifying the Use of CLA for Deepfakes

Causal Layered Analysis (CLA) is a layered, iterative, and transformative method with a multidimensional approach, while the multi-faceted complex landscape of deepfake is deeper and unearthed. The challenging nature of the deepfake technology issue can be understood with the help of CLA, exploring from the litany to systemic cause, from worldviews to myth & metaphor (Inayatullah et al., 2022). CLA will:

- **Uncovering Hidden Dimensions:** The technology behind deepfakes is quite unpredictable, making it not solely a technical issue but also posing a broader spectrum of social and ethical challenges (Ashish Ransom, 2023). CLA encourages us to go beyond the surface level and examine the underlying motivations and societal factors contributing to the rise of deepfakes.
- **Challenging Assumptions:** Society perceives deepfake as a potential threat and danger to various societal factors (Chauhan, 2024). CLA challenges this belief and encourages us to look at the possible advantages of deepfakes, which include entertainment, education, privacy, protection, and more (Inayatullah, 2004). Seeing both the good and bad sides helps us understand this technology better. By considering both the positive and negative aspects of deepfakes, we can gain a more balanced understanding of this technology.
- **Providing a Holistic View:** Deepfakes are a seriously complex issue that intersects technology, society, and ethics (Broinowski, 2022). CLA offers a systematic approach to understanding this intricacy. Its friendly execution allows us to analyze the interconnectedness of different factors and consider various stakeholder perspectives. It also invites us to consider the views of multiple stakeholders. This approach encourages a comprehensive analysis of the ethical, legal, and societal implications of deepfakes. (Inayatullah, 2009)
- **Enhancing Understanding:** Deepfakes are a web of mythical challenges and potential opportunities (Akbar et al., 2023), such as specific aspects such as detection techniques (Ashifur Rahman et al., 2022) or ethical concerns (Ramachandran et al., 2023). CLA's encouraging nature promotes a deeper engagement with the

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problem by triggering us to consider the historical and cultural contexts that shape our understanding of them. By analyzing the underlying narratives and metaphors, we can better understand the fears and anxieties of this technology (Inayatullah, 2008).

- **Facilitating Transformative Solutions:** The wide range and grown nature of deepfake issues has started a new race of potential solutions to these challenges, ranging from technological measures to legislative solutions (Minkkinen & Mäntymäki, 2023; Hoek et al., 2024). However, from a strategic foresight perspective, Inayatullah (2009) has identified that CLA does not merely address problem-solving but provides transformation by understanding the root cause(s) and structural and cultural factors related to the problem. By exploring the hidden factors, CLA fosters the creation of new ideas and strategies for deepfake abuse.

3.1.2 Data Collection

Data collection for this study integrated multiple qualitative and quantitative sources across different CLA layers to ensure a robust, multi-perspective analysis.

- **Litany Layer**: Information was gathered through media reports, institutional documents, statistical surveys, and case studies. These included UN session reports (2024), Twicsy influencer surveys (2024), Security landscape studies (2024), and deepfake case studies reported by BBC, Metro, and other international news outlets.
- **Systemic Causes Layer**: Systematic drivers were extracted from academic literature, regulatory policy reports (such as the EU Global Issue label for deepfakes), technology trend analyses, cybersecurity surveys (e.g., Regula and Jumio reports), and international governance documents.
- **Worldview/Discourse Layer**: Worldviews were constructed through a cultural discourse analysis of deepfake-related narratives, societal reactions, ideological framings in journalism, and academic examinations of epistemic trust, misinformation, and digital ethics.
- **Myth/Metaphor Layer**: Myths and metaphors were identified through thematic analysis of symbolic language, archetypal fears, and recurring imagery found in media narratives, scholarly interpretations, and philosophical discussions on AI and reality manipulation.

The creation of alternative futures was guided by reconstructing each layer toward transformative possibilities. Current litanies of fear and distrust were reimagined through regulatory and awareness interventions. Systemic barriers such as weak policies were transformed into proposals for stronger frameworks. Cultural worldviews of epistemic collapse were shifted toward future narratives of digital trust and resilience. Similarly, dominant metaphors portraying deepfakes as destructive forces were reframed into constructive metaphors emphasizing responsible innovation and ethical governance. This layered reconstruction envisioned plausible pathways toward a trustworthy digital future.

4 CAUSAL LAYERED ANALYSIS OF DEEP FAKE TECHNOLOGY

The trending increase in the sophistication and accessibility of deepfake creation tools has started the "Arms Race" between the creation and detection technologies. The democratization of deepfake apps and the lack of proactive approaches for misuse have skyrocketed deepfake videos (Sippy et al., 2024; Weikmann et al., 2024). The deepfake population on the internet increased by 968% from 2018 to 2020. A large number, about 10,000 and rising, readily deepfake tools make creating hyper-realistic deepfake videos easier for legitimate and malicious users. The surrogate nature of deepfake has badly catalyzed misinformation and disinformation, which raises concerns about integrity, privacy, and public trust. None of the deepfake detection methods is competent for detecting deepfake, either video or audio. However, as deepfake technology continues to evolve, the hype surrounding deepfake related news grew with different worldviews and reactions. The systematic execution of CLA begins with litany, the trending news, and discourses about deepfakes throughout the various societal trajectories. While the analysis emphasizes litany and myth/metaphor, the system and worldview levels were less developed due to space constraints and the specific focus on cultural and emotional imaginaries; future work could expand into these layers for institutional transformation.

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4.1 Litany

The Litany layer is the first level in the Causal Layered Analysis (CLA) method, which examines issues more comprehensively and nuancedly (Inayatullah, 1998). This layer represents the surface level of an issue—the commonly accepted facts, trends, and dominant narratives that are readily observable and frequently reported. It often receives the most attention in everyday discourse and media coverage(Inayatullah, 2004).

The availability of tools made the generation of undetectable pseudo-reality easier for everyone. Such ease in advanced technological tools has questioned the visual and auditory reliability. It increases the vulnerability to misinformation, allowing more people to create and distribute forgeries (Altuncu et al., 2024; Saxena & Cao, 2022). Hyper-realistic content generation overpopulated social media and video-sharing platforms between 2022 and 2023, comprising 50.2% and 34.1% of politicians (Sippy et al., 2024). In response to deepfake risks, researchers are continuously working to detect them; somehow, detection accuracy is over 97% on some limited datasets, but none of the methods is competent to conquer its camouflaging characteristics, which is raising numerous adverse effects on society, especially in the fraudulent and misinformation related issues (Chauhan, 2024; N. Kumar & Kundu, 2024; Passos et al., 2024; Zhang, 2022).

4.1.1 Deepfake Digital Gender-Based Violence and Mental Health Crisis for Feminine

The UN 79 session counted compositional deepfakes as an emerging newer pattern of Gender-Based Violence (GBV) threat for women and girls, which are the primary source for creating realistic fake pornography and interactive deepfakes (UN, 2024). Deepfake psychologically distressed the teens more than other age groups. This led the 14-year-old UK teenager to suicide after uploading fake nudes by her schoolfellows (Metro, 2024). 53.5% of students from an Egyptian university are anxious about the risks of a deepfake. This correlation suggests that increased awareness of deepfakes leads to more significant anxiety about their potential for harm (Al-Nimr, 2024). 94% of female Instagram influencers have fallen victim to deepfake pornography, According to Twicsy report (Twicsy, 2024). In Lancaster County, deepfake pornographic images of more than 50 female students raised deep concern among the parents (Willson, 2024). In addition to the above, Deepfakes can be used to spread disinformation about university leadership, faculty, or the institution itself, potentially causing reputational damage and eroding public trust; the Baltimore High school Teacher's deepfake racist audio of the principal (Looker, 2024) was one of the first cases of such type. Deepfake has also hurt the dignity and integrity of the Laura McClure female member of New Zealand parliament (Aldred, 2025). Table 2 depicts the current and transformed litanies related to deepfake and GBV.

Table 2: *Deepfake Digital GBV: Current and Transformed Litanies*

Current	Transformed
Deepfakes used for GBV, targeting women and girls.	Deepfakes are regulated to protect women.
UK teen's suicide due to fake nudes.	Support systems help teens handle deepfakes.
Students are anxious about deepfake risks.	Deepfake Awareness programs reduce anxiety.
Female influencers are deepfake porn victims.	Laws protect influencers from deepfakes.
Deepfake porn of students raised concern.	Monitoring systems stop deepfake abuse.
Deepfakes spread disinformation about university leaders.	Detection tech prevents reputational harm.
The Teacher's racist deepfake audio of the principal sparked outrage.	Laws penalize harmful deepfakes.

4.1.2 Cybersecurity and Cybercrime Landscape

(Security, 2024) Deepfake is alarming for countries with high dependence on the technology because a deepfake attack occurs every five minutes, and there has been a 244% increase in digital document forgery incidents. Due to the increasing nature of the problem, the European Union (EU) considered Deepfake a "Global Issue" (EU, 2024) as it impacts almost every country. Regula deepfake impact survey (Henry Patishman, 2024) conducted a study on 575 senior managers from Germany, Mexico, the UAE, Singapore, and the US. The research discovered that 92% of the businesses experience a loss of about $200,000 across all industries. While the highest average loss of $60,000 is faced by financial & fintech services. 50% of companies in Mexico and 46% in the United Arab Emirates (UAE) showed

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concern about their reputational damage. The 56% operational loss is more dangerous than the financial loss. There were 253 (44%) executives who were confident about their cybersecurity and deepfake fraud prevention measures.

A study (Jumio, 2024) conducted among 8077 consumers in various sectors of the USA, Mexico, the UK, and Singapore identified that 68% had fallen victim to deepfake scams. In contrast, 72% expressed serious concern about the inevitable risks. Meanwhile, 75% of people switched their banks due to these risks. Despite declining trust and worries from a significant portion of the survey, 60% of the participants felt confident in deepfake detection.

The (McAfee, 2024) Survey indicates that 60% of Americans are apprehensive about holiday deals and scams driven by deepfakes, and 21% have unknowingly paid for fake celebrity-endorsed products. Compared to the previous generation, Millennials and Gen Z suffer the most.

In addition to the above studies, the news is full of deepfake frauds deepfake. Famous personalities, including celebrities and business people, are used as a tool of the trade to gain financial benefits (Stokel-Walker, 2024). The first-ever deepfake scam lured the $243000 CEO OF a UK Company (Stupp, 2019). Among the recent scams, a British lost £75k ($95216) (BBC, 2024b), an Indian duped INR 95 lac ($112153) (TOI, 2024), a Hong Kong $25 million CTO Scam (Magramo, 2024) and a $46 million romance scam (Yeung, 2024), Australia Nick Cave Video Scam $130,000, Canada Ontario $373000, $11k and $12K (CTV, 2023, 2024a, 2024b) using Justin Trudeau Deepfake video on social media.

Table 3 Cybersecurity and Cybercrime: Current and Transformed Litanies

Current	Transformed
Deepfakes are an alarming issue with a rise in digital document forgeries (244%) and frequent attacks.	Deepfake attacks are reduced with stronger cybersecurity measures.
The EU calls deepfakes a "Global Issue" affecting all countries.	Global regulations limit the impact of deepfakes.
Businesses facing loss from deepfake scams, with financial services hit hardest.	Financial safeguards protect businesses from deepfake fraud.
Companies are concerned about reputational damage.	Reputation management tools minimize deepfake risks for businesses.
Operational loss is deemed more dangerous than financial loss.	Operational recovery systems mitigate deepfake-related disruptions.
Executives feel confident in their cybersecurity measures.	Cybersecurity improvements increase executive confidence in deepfake prevention.
Consumers become deepfake scam victims; switching banks due to risks.	Consumer protection programs reduce deepfake scams and boost trust.
Fear of deepfake-driven holiday scams.	Deepfake fraud detection technologies prevent scams during high-risk periods.
Famous personalities used in deepfake scams for financial gain.	Legal protections prevent the misuse of celebrity deepfakes for fraud.
High-profile deepfake scam	International cooperation fights large-scale deepfake fraud.
Cyberattacks use AI-assisted deepfakes targeting executives	AI-driven cybersecurity defends against deepfake-based attacks.
Organizations faced cyberattacks; global cybercrime losses to hit $10.5 trillion by 2025.	Global cybersecurity policies prevent massive cybercrime losses.

4.1.3 Education Sector

Deepfake has significantly impacted academia, posing challenges for students, faculty, and institutions alike (Lowenstein et al., 2024). According to a survey conducted (Thorn, 2024), one out of ten (11% of 1040) students reported that they know friends or classmates who have generated nude deepfakes, known as Self-Generated Child Sexual Abuse Material (SG-CSAM). 38% of North American students knew a victim of deepfake cyberbullying (Roe & Perkins, 2024). Female students are under the target of male students as the New Jersey High School (CBS News, 2024), Pennsylvania High School (LancasterOnline, 2024), where SG-CSAM of female students were created at the mass level, and Pikesville High School Baltimore racist fake audio (BBC, 2024a) is the real-world case studies of the

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deepfake impact on the educational landscape. Such types of incidents have created anxiety and fear in academic institutions as a whole, eroded the trust in academies, and increased cyberbullying, which is a threat to students (CDT, 2024).

Table 4 Deepfake in Education Sector: Current and Transformed Litanies

Current	Transformed
Deepfakes impact academia, posing challenges.	Regulations protect academia from deepfakes.
Peers are making SG-CSAM deepfakes.	Awareness stops SG-CSAM creation.
Students know deepfake cyberbullying victims.	Anti-bullying measures protect students.
Female students targeted by male students in schools.	Protection for female students.
Real cases of deepfake abuse in schools.	Policies prevent deepfake incidents.
Deepfake incidents cause anxiety and erode trust in schools.	Trust-building restores school safety.

4.1.4 Deepfake in Healthcare

The potential best use of deepfake in healthcare is that it can be beneficial for generating content for Personalized Patient Education, Mental Health Interventions, Remote Consultations and Telemedicine, Medical Training and Skill Development, Disease Diagnosis and Treatment, Data Augmentation and Dataset Expansion and Voice Cloning for Speech Impairment (Lakshmi & Hemanth, 2024; Ramachandran et al., 2023). Despite these potential applications, there are significant warnings for healthcare. The Regula survey identified a loss ranging from $99,999 to $249,000 last year due to deepfake fraud in the health sector (Henry Patishman, 2024). Experts have warned about Deepfake doctors circulating on social media (Navarro Martínez et al., 2024). The growing use of misinformation and medical Scams in the health industry raised serious alarms among health professionals by fabricating celebrity endorsements of unproven treatments, impersonating medical professionals to promote fake cures, soliciting sensitive information, or creating videos of patients experiencing side effects from legitimate treatments to fuel vaccine hesitancy or mistrust in healthcare institutions (Stokel-Walker, 2024). A report from Bitdefender highlighted that over 1,000 deepfake videos were used to promote fraudulent health supplements on social media platforms. These videos impersonated celebrities and healthcare professionals, misleading individuals into purchasing ineffective products known as “Miracle Products.” Table 5 portrays the transformed litanies based on the existing data.

Table 5 Deepfake in the Healthcare Sector: Current and Transformed Litanies

Current Litany	Transformed Litany
Possible applications could be personalized education, mental health, telemedicine, training, diagnosis, data expansion, voice cloning.	Deepfake applications enhance healthcare services.
Financial loss in health sector due to deepfake fraud.	Fraud prevention limits healthcare losses.
Deepfake doctors circulating on social media.	Detection tools block fake medical content.
Misinformation, medical scams, and fake endorsements raise concerns.	Stronger regulations prevent medical misinformation.
Deepfake videos are used to promote fraudulent health supplements.	Monitoring systems stop fraudulent health product promotions further risking lives

4.1.5 Deepfake in Democracy and Geo-politics

OpenAI claimed that their latest system had rejected over 25,000 image-generation requests from US politicians during the 2024 US election. Meanwhile, election result requests from 2 million users were asked to visit Associate Press and Reuters (OpenAI, 2024). By redirecting to the single OpenAI source, we asserted that none of the deepfake or AI-generated content was utilized during the 2024 US election. Because numerous uncensored deepfake generation models are freely and commercially available in the market, they can be fine-tuned for any purpose (Dolhansky et al., 2020). The impact of deepfakes on elections in different countries worldwide raises various ethical concerns and highlights the need for countermeasures. Deepfake technology was widely adopted during the election in India, Slovakia, Ukraine, Malaysia, Gabon, Bangladesh, South Korea, and the United States (Gabor et al., 2024). It is misused against politicians and journalists to damage their reputations and generate content for more reach. The USA and South Korea were the only countries that applied a proactive approach by banning the production and

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dissemination of deepfakes (Loewenstein, 2024). Additionally, a huge flood misinformation and information using deepfake has been observed during the 2025 India–Pakistan conflict, codename operation Bunyan al-Marsus and operation Sindoor. It was spread on the Social media and electronic media of the both countries (IFJ, 2025). However, the same surge in AI-generated media continue to flood the online narrative has been witnessed in the Iran–Israel war 2025 (Radware, 2025). Table 6 summarizes a study conducted from Q1 2023 to Q1 2024 on the usage of deepfake in elections, which shows an alarming increase in the use of deepfake in various countries (SumSub, 2024).

Table 6 Countries with deepfake cases during the election as per (SumSub 2024)

Country	YoY Deepfake Scam Growth (%)
Bulgaria	3000
Portugal	1,700
South Korea	1,625
Indonesia	1,550
Moldova	900
Belgium	800
Mexico	500
South Africa	500
United States	303
India	280
Spain	191
Germany	142
France	97

The increasing number of deepfakes online, with a tripling in 2023 compared to 2022, presents a global challenge to the integrity of information and democratic processes. Public awareness of deepfakes and concerns about their potential to influence elections are growing, particularly in countries like the UK and Germany (Łabuz & Nehring, 2024; SumSub, 2024). The transformed futures of deepfake in democracy are portrayed in Table 7

Table 7: Deepfake in Democracy and Geo-politics Current and Transformed Litanies

Current Litany	Transformed Litany
OpenAI blocked image generation requests from US politicians during 2024 elections.	AI regulation prevents misuse in elections.
No deepfakes or AI content used in US election 2024.	Election monitoring ensures content integrity.
Deepfake models freely available for misuse in elections.	Stronger controls limit deepfake accessibility.
Deepfakes used in elections worldwide.	Global policies curb deepfake influence in elections.
Deepfakes harm politicians' reputations in multiple countries.	Reputation safeguards protect politicians.
Some countries have banned deepfake production during elections.	Proactive measures prevent deepfake misuse.
Alarming rise in deepfake use in elections globally.	Ongoing research tracks deepfake trends.

4.1.6 Ecological Impact of Deepfake.

Deepfake technology could have potential applications in ecological and environmental contexts. It can offer an innovative approach to wildlife management (Real-time tracking and holistic understanding using ecological sensors), animal health monitoring, data augmentation (agricultural enhancements), biodiversity surveys, and citizen science (environmental research) (Johri et al., 2024; Neethirajan, 2021). On the other hand, the exceptionally high computational and energy requirements of deepfake technology significantly impact the environment. A deepfake model, when trained, can emit up to 284 tons of CO_2 per model, which is equivalent to the emission of five cars over the model's lifetime (Strubell et al., 2020). During weeks of training, high-performance GPUs consume approximately 300 watts/hour and, therefore, require several megawatt-hours of energy (Shterionov & Vanmassenhove, 2022).

Furthermore, storing terabytes of high-resolution media data also consumes considerable energy, emphasizing the need for sustainable AI practices (Goff, 2024). Additionally, storing terabytes of high-resolution media data increases

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energy usage, highlighting the urgent need for sustainable AI practices (Goff, 2024). Table 8 contains current and transformed litanies related to the deepfake impact on the ecology.

Table 8: Deepfake impact on Ecology: Current and Transformed Litanies

Current Litany	Transformed Litany
Deepfake tech can aid wildlife management, animal health, agriculture, and biodiversity.	Sustainable AI enhances ecological efforts.
Deepfake models emit up to 284 tons of CO_2 per model.	Eco-friendly practices reduce carbon emissions.
High GPU power consumption requires several megawatt hours of energy.	Energy-efficient AI reduces power usage.
Storing terabytes of high-resolution data increases energy consumption.	Data management reduces energy costs.

4.2 Systematic Causes

The systematic causes layer of CLA includes an in-depth analysis of the underlying socio-economic, political, technological, and environmental factors influencing the issue. This layer focuses on the trends and drivers of change, meaning the structural and systemic causes that shape the observable reality come out the way it does (Inayatullah, 2004). Consequently, we delve deeper into the socioeconomic, political, technological, and environmental factors that underpin the deepfake phenomenon - the emergence and diffusion of deepfake technology and explain its arising profoundly on systemic foundations with a vast potential of influence.

4.2.1 Technological Factors

There has been rapid advancement in highly optimized deep learning algorithms that generate sophisticated and realistic synthetic media. This advancement makes it difficult to distinguish or identify deepfake-generated videos (Passos et al., 2024). The evaluation of deepfake, ranging from simple AI manipulation to revolutionary content generation, has raised emerging challenges for society. The innovation has started a new “arms race” between deepfake creation and detection tools and techniques (Mishkhal et al., 2024; Negi et al., 2021; Rathi et al., 2024). On the other hand, deepfake detection methods are still maturing. These algorithms have promising results in the controlled environment with particular models. At the same time, a significant challenge remains: the need for greater generalizability when these algorithms encounter deepfakes generated from unseen models or techniques (Mishkhal et al., 2024). The accessibility of deepfake tools has grown significantly. User-friendly software and online platforms make these tools widely available. The democratization of technology has shifted deepfake creation from technical expertise to average users (Mary & Edison, 2023). Technical expertise is no longer a strict requirement. Reduced barriers to entry have fueled broader adoption. This ease of access also increases the potential for misuse (Rathi et al., 2024).

4.2.2 Socio-Economic Factors

Socio-economic factors play a critical role in the rise of deepfake technology. The potential for financial gain drives its development and misuse (Rathi et al., 2024). Profit-driven motivates fraudulent activities such as scams, identity theft, and market manipulation (Mankoo, 2023). Additionally, there is a growing demand for realistic digital content across industries like entertainment, advertising, and marketing, which fosters innovation in creating and manipulating visual media. However, the dual-use nature of such advancements enables both positive applications and misuse. The same tools designed for creativity and progress are often exploited for malicious purposes (Arif et al., 2024; Chauhan, 2024; Hernandez, 2024). Recently, Denmark unveiled Europe’s first copyright reform to combat deepfakes and to protect citizens from deepfake, granting individuals legal ownership of their voice, body, and facial features (Bryant, 2025).

4.2.3 Lack of Regulation

One of the most significant factors related to the misuse of deepfake technology is the need for universal regulation and accountability. The absence of clear legal frameworks allows malicious actors to exploit deepfakes without facing significant consequences. The regulatory vacuum enables the unchecked creation and distribution of harmful synthetic media online (Ashish Ransom, 2023; Minkkinen & Mäntymäki, 2023; Pawlicka et al., 2023). However, to mitigate

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the risks and provide a safe digital environment to the communities, the countries are struggling to develop and implement a solid, robust regulatory framework (Mania, 2024), like the United States "Executive Order 14110 on AI", the European Union's proposed "Artificial Intelligence Act," and various state-level laws addressing aspects of deepfakes in the US (Chun et al., 2024). These initiatives aim to introduce accountability, transparency, and ethical guidelines for developing and using AI, including deepfake technology (Odelberg, 2024). They also explore strategies like content labeling, platform moderation, and international collaboration to mitigate the risks posed by deepfakes (Odelberg, 2024).

4.2.4 Social Media Amplification

As of October 2024, out of the 8.22 billion world population, there are 5.22 billion active social media users with a spent of 2 hours 19 minutes (DataReportal, 2024). Such a vast number of social media users makes social media platforms the tipping point for spreading deepfakes (Sudarsan et al., 2024). Social media's proliferation and viral nature facilitate the amplification of deepfake dissemination because of their engagement and attention-focused algorithms rather than the truth and accuracy (Liu et al., 2023). The realistic, creative, deceptive, and entertainment level of deepfake content is booming on social media, as sensational or controversial content is more likely to gain traction and reach more expansive audiences (Law Kian Seng et al., 2024). Additionally, the available deepfake detection technology and methods cannot identify the synthetic content, creating a loophole for the notorious users (Hernandez, 2024; Mankoo, 2023).

4.2.5 Lack of Public Awareness:

A notable percentage of the population must be aware of deepfakes' existence, capabilities, and implications. Most people also need more introductory knowledge about deepfakes. Many active intended help users must distinguish deepfakes from authentic videos (Doss et al., 2022). This lack of awareness makes individuals more vulnerable to deception, as they may need to be equipped to identify or critically evaluate deepfake content (Ashifur Rahman et al., 2022; Law Kian Seng et al., 2024).

CLA is used to uncover the societal challenge of PESTLE (political, economic, social, legal, and environmental), and related terminologies are the core of the systematic causes of CLA (Bussey, 2014; Inayatullah et al., 2022). It is a phenomenon that every aspect that impacts society or the system, whether directly or indirectly, is proportional to the PESTLE, including drivers and actors (Inayatullah, 2004). Drivers are entities, underlying forces, or trends that cause or push changes in the external environment. At the same time, actors are the key stakeholders or participants who influence the factors (Naughtin et al., 2024). **Table 2** portrays an in-depth image of the system causes of deepfake.

Table 9 Impact of Deepfake a multi-dimensional view

Dimension	Aspect	Driver	Actor(s)	Impact	Promoter(s)	Enablers / Amplifiers
Technological	Technological Advancements	Advancements in AI and deep learning algorithms	AI researchers, tech companies, online platforms	Increased realism of deepfakes, harder to detect, accessibility of deepfake creation tools.	AI researchers, tech companies like Open AI, Google, NVIDIA, social media platforms	AI-based deepfake creation software, social media platforms
Technological, Social	Ease of Accessibility	Democratization of deepfake creation tools	Users, creators, amateur hackers	Rise in fake content, more widespread malicious use, and ease of creation by non-experts.	Software developers, open-source communities	Online platforms, software apps
Technological, Legal	Detection Challenges	Constant evolution of deepfake methods and models	Cybersecurity firms, government agencies, AI companies	Detection technologies struggle to keep up with evolving deepfake techniques, leading to an increasing risk of fraud.	Cybersecurity firms, AI researchers	AI detection software, security tools
Economic, Legal	Fraud & Cybercrime	Increase in financial fraud and identity theft	Cybercriminals, business executives, consumers	Rising instances of financial fraud, scams, and identity theft	Cybersecurity companies, financial	Online marketplaces, video-sharing

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				facilitated by deepfakes.	institutions, governments	platforms, social media
Social, Legal	Gender-based Violence	Use of deepfakes for digital harassment, gender-based violence	Perpetrators, affected individuals (mainly women and girls)	Increased psychological distress, suicide cases, and reputational harm due to fake content.	Social media platforms, online communities, anti-abuse organizations	Social media, video-sharing sites, deepfake creation tools
Political, Social	Misinformation and Political Impact	Use of deepfakes in politics and elections e.g., electoral manipulation	Politicians, journalists, voters, political parties	Damage to reputations, political influence, and election integrity due to the spread of deepfake content.	Political parties, media outlets, advocacy groups	Social media, news outlets, AI platforms
Economic, Legal	Economic Losses	Financial fraud and operational disruption due to deepfakes	Business leaders, financial institutions, consumers	Losses from fraud, reputational damage, operational disruption, and declining consumer trust in financial services.	Businesses, financial institutions, fraud prevention companies	Digital identity verification platforms, banking apps, social media
Social, Educational	Educational Impact	Use of deepfakes in cyberbullying, fraud targeting students	Students, educators, schools, administrators	Erosion of trust in educational institutions, cyberbullying, psychological harm to students.	Schools, parents, educational policymakers	Educational institutions, social media, video-sharing platforms
Economic, Legal, Social	Healthcare Sector Risks	Deepfakes used in medical fraud and misinformation	Healthcare providers, patients, fraudsters, regulators	Spread of false medical advice, consumer distrust, and financial losses in healthcare industry due to deepfake fraud.	Healthcare organizations, regulators, AI companies	Healthcare websites, social media, e-commerce platforms, video sharing platforms
Environmental, Technological	Environmental Impact	Energy consumption due to the high computational cost of deepfake creation	AI companies, energy providers, environmentalists	Significant energy consumption, contributing to carbon emissions and environmental harm from deepfake model training.	Environmental NGOs, AI companies, energy companies	High-performance computing resources, cloud servers
Social, Technological	Social Media Amplification	Viral spread of deepfakes on platforms	Social media platforms, users, influencers	Rapid spread of misinformation, influence on public opinion, and damage to reputations due to unmoderated content on social platforms.	Social media platforms (e.g., Facebook, Twitter, Instagram), influencers, media companies	Social media platforms, video sharing platforms, online content sharing sites,
Legal, Political	Lack of Regulation	The absence of universal regulatory frameworks	Governments, policymakers, AI developers	Increased misuse of deepfakes due to regulatory vacuum, enabling malicious actors to operate without consequences.	Regulatory bodies, legal experts, government agencies	Online platforms, AI development communities
Social, Educational	Public Awareness	Lack of awareness regarding deepfake risks	The general public, media outlets, educational institutions	Higher vulnerability to deepfakes, inability to identify or respond to fake content, spread of misinformation.	Awareness campaigns, media organizations, educational systems	Online media, educational platforms, social media

In the above table, the platforms column “Social Media” and “Video Sharing Platforms” are standard for all aspects, acting as enablers and amplifiers. There, it is the *tipping point* for any consequence caused by deepfake.

4.3 Worldviews/Discourse

The worldview/discourse layer examines the underlying assumptions, beliefs, and values that shape how people understand a particular issue (Inayatullah, 2004). This layer goes beyond the surface-level observations and systemic causes to explore the deeper cultural, linguistic, and social structures that influence perceptions and responses

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(Inayatullah, 1998). The key characteristics of this layer are focus on narratives and discourses, unveiling hidden assumptions, exploring power dynamics, and identifying values and ideologies, which emphasizes the importance of understanding the deeper cultural and social context in which an issue like deepfakes exists (Wahab, 2024). The rapid growth in deepfakes has raised a complex interplay of beliefs, values, and ideologies, shaping how people understand deepfakes.

4.3.1 Trust and Epistemic Authority:

A pervasive concern about the *"epistemic threat"* posed by deepfakes - the potential to undermine our ability to discern truth and reality (Habgood-Coote, 2023; Kerner & Risse, 2021; Vasist & Krishnan, 2023). This threat is often framed as a possible *"information apocalypse"* characterized by a complete blurring of the lines between truth and falsehood and an erosion of trust in information sources (Anderson, 2024; Łabuz & Nehring, 2024). A profoundly ingrained societal belief in the authenticity of visual evidence. This trust in *"seeing is believing"* is being challenged by deepfakes, which can produce visually convincing yet fabricated content (Fallis, 2021; Kerner & Risse, 2021; Stephan, 2020). Deepfake has threatened the credibility of historical records, legal proceedings, and retrospective journalism data (Habgood-Coote, 2023; Kerner & Risse, 2021). The deceptive manipulation ability of deepfake has promoted skepticism towards the traditional sources of authority like media, especially digital media, government, and scientific authorities. Misinformation and disinformation are the essence of deepfake, which made scholars divide it into two different moral foundations: Individualizing (emphasizing empathy and justice) and Binding (valuing group cohesion, authority, and social order) (Gamage et al., 2023).

4.3.2 Technological Determinism and Societal Impact:

From a *dystopian* and *technological determinist* perspective, deepfake is a warning of *"infopocalypse,"* where overwhelming misinformation and disinformation make it harder to distinguish truth from falsehood. Similarly, technological determinists believe that society is controlled by technology (Aliman & Kester, 2022; Fallis, 2021; Habgood-Coote, 2023; Weikmann & Lecheler, 2023). This belief emphasizes combating deepfakes with technology due to technology's power to create and solve problems (Doss et al., 2023; Mary & Edison, 2023). Another view acknowledges a complex interaction between technology and social dynamics. Thus, deepfakes are intensifying the existing societal issues even further, such as political polarization, misinformation, and bias. The rapid dissemination of deepfake videos through social media can negatively impact society, as these videos can garner millions of views quickly (Akbar et al., 2023).

4.3.3 Human Vulnerability and Cognitive Biases:

Deepfake has exploited the human cognition tendency towards rationality and the susceptibility to manipulation. Especially the tendency to believe what we see and confirm our existing beliefs. Due to the cognitive biases of the human. This perspective validates that technology can easily fool an individual because of limited thinking ability (Casu et al., 2024; Ecker et al., 2022). Deepfake technology promotes the *"liar's dividend,"* where fake content can readily be accepted as trustworthy, and genuine content can be easily dismissed as bogus. This phenomenon has eroded trust and increased uncertainty (Fallis, 2021; Habgood-Coote, 2023; Holliday, 2021). To address this complex information landscape, society has to empower individuals' critical thinking to rationalize fact from fiction (Gregory, 2023; Rathi et al., 2024).

4.3.4 Ethical and Ideological Dimensions:

Deepfakes are framed as a threat to democratic values and processes. This reflects a belief in the importance of truth, transparency, and accountability in a functioning democracy (Ashifur Rahman et al., 2022; Łabuz & Nehring, 2024; Yu, 2024). Deepfakes have raised ethical concerns about malicious purposes, such as spreading disinformation, harming reputations, and manipulating individuals. This highlights a value system prioritizing honesty, fairness, and respect for others (Ashifur Rahman et al., 2022; Mary & Edison, 2023; Rathi et al., 2024). There is a spectrum of views on the role of technology in society. Some express optimism about the potential benefits of AI, while others caution against its potential dangers. This reflects ongoing debates about the ethical development and use of Generative AI (Dolhansky et al., 2020; Lowenstein et al., 2024; Mary & Edison, 2023; Rathi et al., 2024).

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4.3.5 Dominant Narratives and Perspectives:

An established narrative positions deepfakes as powerful tools that may be weaponized for malicious intent, especially by state-level actors and those seeking to undermine trust and stability. Deepfakes are often framed (and quite rightly) within a broader "information war" that combines the rise of disinformation with declining trust in traditional information sources (Golda et al., 2024; Katarya & Lal, 2020; Shapovalova, 2024). A recurring theme is the responsibility of people and society to be more vigilant against deepfakes, hone their critical thinking, and be discerning regarding what information they receive and what they will spread (Golda et al., 2024; Law Kian Seng et al., 2024; Sütterlin et al., 2022). Although the prevailing narrative around deepfakes is one of threat and concern, there are several potential applications of deepfake technology in favorable areas, such as entertainment, education, and healthcare, to name a few. This reflects a tension between the gold standard's positive uses of the technology and the potential of light-dark technology applications (Chauhan, 2024; Hoek et al., 2024; Rathi et al., 2024). A competing narrative downplays the impact and significance of deepfakes, suggesting that fears about their influence might be exaggerated (Łabuz & Nehring, 2024). In conclusion, the above illustrates how understandings of deepfakes are shaped by pre-existing beliefs about technology, truth, and authority, as well as anxieties about societal trust and the future of information. Dominant narratives frame deepfakes as potent weapons in an ongoing information war, highlighting the need for vigilance and critical engagement with the evolving media landscape.

4.4 Myths/Metaphors: Exploring the Deeper Implications of Deepfakes

Deepfake technology has engendered many myths that profoundly affect societal perceptions, especially their integrity and ramifications. Such misunderstandings frequently arise from an inadequate comprehension of the technology and its prospective effects, resulting in amplified anxieties and the dissemination of misleading information.

4.4.1 Myths related to Deepfake.

There is a belief that deepfake is a newly emerging era of technology, while the technology has been evolving for years (Morris, 2024). One of the most common myths surrounding deepfake technology is that it is only a malicious tool and can only be used for abuse and cyberbullying activities. At the same time, it has potential applications in various industries like entertainment, advertising, education, and healthcare (Maharjan & Shakya, 2023). Before Generative-AI-based Deepfake, it was relatively easy to distinguish between fake and genuine content due to facial inconsistencies in the generated video or image. However, the myth about identifying deepfake-generated content with human cognition overestimates technological advancement because the technology has failed to differentiate deepfake content effectively (Mone, 2023; Walker et al., 2023). Social media has infiltrated various misconceptions, particularly about the harmless nature of deepfakes due to engaging and entertaining accurate content. People ignore the ethical implications and potential for exploitation, especially regarding consent (Wagner & Blewer, 2019).

Additionally, the public response is predominantly negative, claiming that deepfakes pose a real danger to democracy and can cause geopolitical tension throughout the world (Broinowski, 2022). Several synthetic videos of world leaders circulating online reflect a mythologized view of political figures and the media(Twomey et al., 2023). This creates a myth that deepfakes are solely harmful and will lead to the collapse of reality.

Contrary to this belief, deepfakes are potentially innovative communication tools that offer "New Hope" for marketing and engagement (Whittaker et al., 2021). Simultaneously, studies suggest that deepfakes are not effective at changing minds but are more likely to reinforce existing beliefs and identities (Nieweglowska et al., 2023). The study reflects a myth that deepfakes only affect political figures, while the reality is that they can disproportionately impact marginalized communities, further undermining their political standing (Pawlicka et al., 2023). Moreover, concerns about deepfakes being a unique danger are likely exaggerated (Habgood-Coote, 2023). There is also a belief that deepfakes will inevitably lead to severe epistemic harm without considering the possibility of their allure diminishing over time(Cavedon-Taylor, 2024).

4.4.2 Metaphors used in deepfake

Starting from the term "Deepfake" itself is the portmanteau of "deep learning," and "fake" immediately signals artificiality and deception (Anderson, 2024). "Synthetic media" emphasizes the artificial and constructed nature of

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Deepfake content, further highlighting the departure from genuine human expression (Mary & Edison, 2023). "Information Apocalypse" This metaphor captures the apocalyptic fear that deepfakes could usher in an era where truth is completely obscured, and trust in information becomes impossible (Łabuz & Nehring, 2024). The sources use metaphors like "Pandora's Box" and the "unleashing of chaos" to describe the societal consequences of Deepfake technology, highlighting anxieties about its potential for harm (Zhao et al., 2021). These metaphors draw on mythology to convey the gravity of the risks associated with Deepfakes. The evolving relationship between Deepfake creation and detection techniques metaphorically uses the term "arms races." (Chauhan, 2024). This language suggests a constant battle between those seeking to deceive and those striving to expose deception. In the context of news and information, "Disinformation" and "Deep news" metaphorically emphasize deepfake's potential to erode trust in information sources and undermine societal processes, such as democratic processes (Atlam et al., 2025; Chauhan, 2024). From a philosophical perspective, the metaphor "Semiotic Deepfakes" (Poulsen, 2021) highlights the potential capacity of deepfakes to generate text that convincingly mimics human writing styles, blurring the lines between human and machine creation, which mislead the public about authorship, particularly regarding textual content (Leone, 2023).

Meanwhile, the potential for Deepfakes to be used for both creative and destructive purposes is conceptualized as the *"Creator/Destroyer."* This duality highlights questions about who controls this technology and how it will be used to shape the future (Hernandez, 2024). "Fear of deception" is another dominant narrative related to the anxiety amplified by deepfake because of the deep-seated fear of being tricked, manipulated, and having our sense of reality undermined (Weikmann et al., 2024). In mythology and folklore, the *"trickster archetype"* metaphor is illustrated as a cunning and mischievous figure who disrupts the established order through deception and illusion (Law Kian Seng et al., 2024). Meanwhile, deepfake manipulated content is the emerging manifestation of the trickster archetype, blurring the lines between truth and falsehood and sowing seeds of doubt and suspicion (Loewenstein, 2024; Zhao et al., 2021). The term *"digital chameleon"* denotes the seamless blending capability of deepfake content generation, which is almost impossible to detect. Deepfakes are a "digital chameleon," capable of blending seamlessly into the visual landscape, making them challenging to detect (Gopalakrishnan et al., 2024; Rickli & Mantellassi, 2023; Yan et al., 2024). The risks and opportunities of deepfake technology, which can be used for both creative expression and malicious purposes, are metaphorically represented as a "double-edged sword." Swapping identities and creating a façade to mislead viewers are perceived as a *"digital masquerade."*

Meanwhile, the metaphors *"digital puppetry"* (Antinori, 2019) and "Deep puppets" (Anderson, 2024) are interchangeably described as how deepfake is fostering the manipulation of reality and the erosion of authenticity (Hill, 2020). In the context of post-era truth, the metaphor of a *"marketplace of ideas"* illustrates the commercialization of the truth, where truth is treated as a product, and products are designed according to individual beliefs (Eller, 2023; Schroeder, 2021). *"informulacra"* metaphorically represents the confusion caused by distorted societal truths, mainly influenced by deepfakes (Eller, 2023). The metaphor *"Digital Pollution"* emphasizes degrading the quality of our digital information ecosystem because of artificially generated content (Łabuz & Nehring, 2024).

The concept of *"hyperreality"* or "Hyper-realistic" reflects the indistinguishable state of deepfake-generated videos from actual footage, reflecting the complexities of trust in visual information (Cover et al., 2022). The emphasis on the psychological impact of deepfakes, termed the *"uncanny valley,"* represents how technology affects people's mental Comfort because shared content closely mimics human features but still appears slightly off (Kaate et al., 2024; Wagner & Blewer, 2019). The metaphor *"Digital Wild West"* refers to the context of the current landscape of deepfake technology and is compared to a lawless frontier, where anyone can create convincing fakes, leading to potential chaos in information dissemination (Fletcher, 2018; Kaate et al., 2024). Deepfakes are likened to a "bathwater" that may lead to the loss of the "backstop baby," suggesting that the fear of deepfakes could cause a general distrust of all recordings (Hansen, 2024; Rini, 2020). Deepfakes are framed as a "smoking gun," (Hutchinson et al., 2024) suggesting they can serve as fabricated confessions to manipulate narratives (Sobel, 2024). The continuous evolution between deepfake advancement and detection methods raised various cybersecurity concerns this metaphorically represented as "cat-and-mouse." Last, regarding the various society groups, "herd correction" indicates how different groups can protect each other from deepfake threats, such as herds protecting from a wolf pack (Lovato et al., 2024).

The above list is subject to the limitations of specific studies. The advancement of deepfake technology and its impact on society are increasing the number of myths and metaphors.

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5 CLA SUMMARY

5.1 Iterative execution

While the CLA method is presented sequentially through litany, systemic causes, worldview, and myth/metaphor layers, this research acknowledges that these layers are deeply interconnected. Layers are impacting on each other. For instance, myths and metaphors, such as the notion of "deepfakes as digital tricksters," influence societal worldviews regarding trust and deception. These worldviews, in turn, reinforce or challenge systemic structures like regulation and media governance, ultimately shaping the everyday discourses captured at the litany level. Thus, the analysis employed both vertical movement—traversing up and down through the layers to explore causal relationships—and lateral movement—examining how different elements within the same layer reinforce or contest one another. This dynamic approach ensured that the CLA was not treated as a linear exercise but as a fluid, interdependent system of meaning-making. Similarly, the CLA application in this research is iterative rather than strictly linear. The vertical movement between layers was employed to explore how myth/metaphor shifts could cascade upward to alter systemic and litany layers. Simultaneously, lateral movements within layers were considered, demonstrating how competing worldviews or litany discourses reinforce or disrupt existing narratives. For instance, the myth of 'digital chameleon' influenced trust discourses (worldview) and triggered systemic cybersecurity responses.

5.2 CLA Mapping: From Fear to Responsibility

The classical CLA chart shows how our understanding of deepfake technology can shift from fear and harm toward hope and responsibility. Right now, deepfakes are spreading rapidly, leading to issues like misinformation, cyberbullying, and a growing distrust in what we see online. The systems in place—like weak regulations and easy access to deepfake tools—make things worse. Many people feel uncertain and anxious, believing that technology is mostly a threat. Powerful metaphors like “Pandora’s Box” and “Digital Trickster” fuel this fear. But looking ahead, a better future is possible. With stronger laws, smarter detection tools, and better education, we can use deepfakes in positive ways—like in learning and creativity. The public mindset can shift too, from fear to awareness and shared responsibility. In this future, deepfakes become tools for good, not just harm, helping us build a more secure and trustworthy digital world. Table 10 depicts the summary of CLA of current and transformed Futures.

CLA Layer	Current State (Today)	Transformed Future (Tomorrow)
Litany	- Proliferation of deepfakes on social media - Rise in digital gender-based violence (DGBV) - Teen suicides due to fake nudes - Erosion of trust	- Effective deepfake regulation and detection - Teen protection and digital mental health support - Public trust regained via transparency tools
Systemic Causes	- Lack of universal regulation - Arms race between deepfake creation & detection - Democratization of malicious tools - Social media amplification	- Global legal frameworks on AI/deepfakes - AI-powered ethical detection systems - Secure media distribution protocols - Educational interventions
Worldview	- “Seeing is deceiving” replaces “seeing is believing” - Technology as a threat - Erosion of epistemic trust and truth - Hyper-individualism in media	- “Trust through transparency” - Ethical innovation and AI optimism - Collective responsibility in digital literacy - Inclusive democratic values
Myth/ Metaphor	- Deepfake as Pandora’s Box, Digital Trickster, Arms Race, Digital Puppetry, Chameleon, Information Apocalypse	- Deepfake as Double-Edged Sword, Digital Vaccine, Digital Literacy Catalyst, Guardian of Imagination, Mirror of Society

Table 10 CLA Chart for Deepfake Technology

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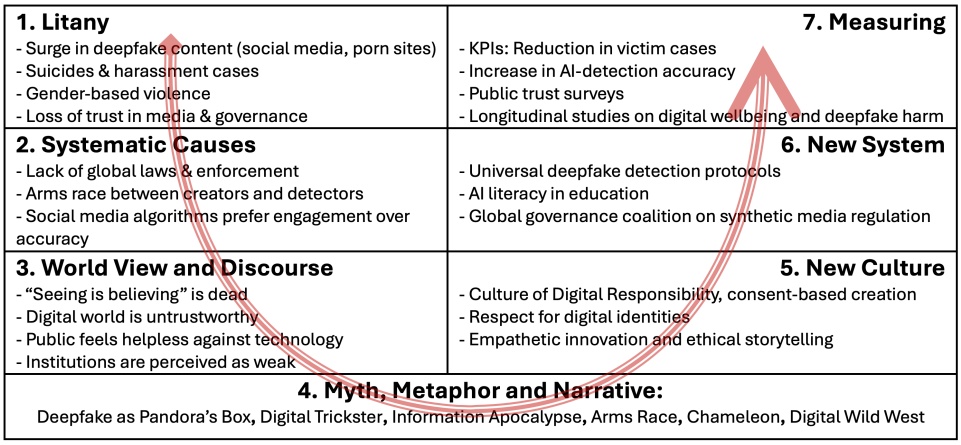
1. Litany
- Surge in deepfake content (social media, porn sites)
- Suicides & harassment cases
- Gender-based violence
- Loss of trust in media & governance
7. Measuring
- KPIs: Reduction in victim cases
- Increase in AI-detection accuracy
- Public trust surveys
- Longitudinal studies on digital wellbeing and deepfake harm
2. Systematic Causes
- Lack of global laws & enforcement
- Arms race between creators and detectors
- Social media algorithms prefer engagement over accuracy
6. New System
- Universal deepfake detection protocols
- AI literacy in education
- Global governance coalition on synthetic media regulation
3. World View and Discourse
- "Seeing is believing" is dead
- Digital world is untrustworthy
- Public feels helpless against technology
- Institutions are perceived as weak
5. New Culture
- Culture of Digital Responsibility, consent-based creation
- Respect for digital identities
- Empathetic innovation and ethical storytelling
4. Myth, Metaphor and Narrative:
Deepfake as Pandora's Box, Digital Trickster, Information Apocalypse, Arms Race, Chameleon, Digital Wild West

Figure 2 CLA Iterative approach for Deepfake

Additionally, Figure 2 contains that to build a safer digital future, we must start with a New Culture that promotes digital responsibility, ethical innovation, and respect for consent. This shift moves us beyond fear to proactive engagement. Supporting this, a New System is essential—featuring universal deepfake detection protocols, AI literacy in education, and global cooperation among governments, platforms, and civil society. To ensure accountability, measuring progress is key. This includes tracking reductions in deepfake abuse, improvements in detection accuracy, and rising public trust through surveys and long-term well-being studies. Together, these pillars can turn deepfake challenges into pathways for a trustworthy digital future. Iteratively, the new system and new culture used as litany to perform the CLA for the current system.

5.3 Balanced CLA: Rebuttal and Hopeful Narratives

While the manuscript originally focused on cautionary and dystopian narratives surrounding deepfakes, a more balanced foresight approach—consistent with CLA—also requires surfacing hopeful, positive imaginaries. While te transformed column of CLA has provided numerous solutions they are still problem based. Below is a complementary analysis exploring transformative possibilities that deepfake technologies may enable, particularly for marginalized and silenced voices. These emerge from radical scenarios of what can become.

Reimagined Litany:

- Emergence of AI-powered cultural translation platforms preserving endangered dialects. Languages can thus not just survive but thrive.
- Development of digital archives enabling intergenerational storytelling. Story telling would be transformed here, creating a weaved heritage with the past.
- Use of deepfakes for heritage reconstruction and immersive educational experiences. In this future, the past comes alive. We are already witnessing this through numerous AI media clips on TikTok where current news reporters interview citizens from the last few thousand years.
- Tools for self-representation and digital storytelling by marginalized communities. In this future, marginalized communities transform deep fakes into eternal truths.
- Use of deepfake technologies to recreate historical speeches or moments in native languages to educate younger generations. This helps in teaching history – making it embodied

Reimagined Myth/Metaphor:

From these possibilities, new metaphors can emerge. While indepth ethnographic research is needed to determine the most appropriate metaphors, the following are possible suggestions:

- *Digital Weaver:* Weaving ancestral memories and forgotten words into vibrant, living cultural tapestries.
- *Digital Talking Circle:* Enabling inclusive dialogue where communities co-create and share their own narratives.

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- *Narrative Compass:* Guiding communities through reflection and history toward empowered futures.
- *Cultural Gardener:* Cultivating heritage with care, planting new seeds, and nurturing evolving traditions through digital media.
- *Digital Phoenix*: Languages and memories reborn through AI-based storytelling.
- *AI Minstrel*: Singing songs of resistance and cultural pride in forgotten tongues.
- *Digital Mirror*: A technology of care, reflection, and narrative healing.
- *Digital Caregiver*: An ever-evolving companion preserving values and heritage through emotion-driven media.

These additional narratives offer a counterweight to the prevailing threats of deception and manipulation, showing that the same technologies can be channeled toward justice, preservation, and emotional care.

Which futures will arise is the critical question – thus the purpose of this essay, to use CLA to map depth based alternative futures so that wiser policymaking can be created. The next section suggests recommendations based on the research.

6 RECOMMENDATIONS

CLA analysis of deepfake technology has uncovered significant critical findings highlighting emerging trends' intricacies and implications. The insight of studying various myths and metaphors that have emerged about deepfake. This has triggered some serious mental health particularly anxiety and emotional distress, that can cause suicide. Based on the CLA insights, the following steps are recommended for policymakers:

6.1 Policy Recommendations

Preventing at a tipping point: Social Media and Websites: About 63% of the population has a strong emotional attachment to social media, and this is the tipping point where deepfake proliferation booms. If OpenAI can block thousands of image generation requests and Facebook blocks deepfake media for spreading misinformation about politics, this should be executed for everyone. The Generative-AI and Deepfake models are trained on the publicly available data collected from the web and social media. Similarly, notorious people take publicly available images of a particular person and generate explicit deepfake videos, either of celebrities or ordinary individuals. The deep nudes are shared back to the public web, either social media or pornographic websites, to victimize that person. Consent regarding the ethical use of deepfake and AI generation fails because no one follows these moral guidelines. To prevent such type of content, explicit and harmful, a universal model (Dataset) of all the publicly available data, including pictures and videos, is required to be applied across the web, including pornographic websites. The model can be used through the web, ranging from a commonly hosted site to adultery websites and social media to search engines.

Preventing Death and Suicide Rate: There is nothing more valuable than a human's life. Currently, there are only two or three cases of death caused by deepfake pornographic manipulation. If proactive measures are not taken on time, the number could be increased. Social media platforms must establish an intuitive, straightforward, and accessible reporting mechanism that is possibly similar to the buy button of e-commerce websites. Platforms should prioritize the review and removal of such content. The suicide rate among teenagers is higher as compared to adults. Most deepfakes are generated by their peers, especially against their female fellows. To mitigate the anxiety rate due to deepfakes, an actionable guideline for the cognitive impact of deepfakes should be started in collaboration with psychological experts. All social media platforms should be bound to roll out publicly on every profile without redirecting to another page. Similarly, school-level digital literacy programs related to deepfake impact should be started immediately. Lastly, serious action should be taken against those who are involved in cyberbullying.

News Transparency: News With the proliferation of misinformation and the introduction of deepfake technology, news organizations and digital publications need strict pre-publication measures to avoid the danger of spreading misinformation or virulent information. In the first instance, media outlets should conduct a rigorous verification process with human skills and AI-based tools to verify sources, videos, and images before publication. It means

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confirming statements with trusted, authoritative sources, doing comprehensive fact-checking, and using advanced deepfake detection systems to flag faked content. Further, editorial procedures should be more transparent; media should inform audiences about how they are checked and establish clear protocols to identify AI-generated or manipulated information so that readers understand what their media is exposed to. Further, media literacy is also essential in building an informed public that can critically analyze news. In addition to investing in ongoing journalist training, collaborating with tech companies to build detection systems, and teaching the public about them, newsrooms can actively fight off misinformation and deepfakes. In the end, the combination of technology, editorial openness, and public education will significantly diminish the effect of misinformation and rebuild public confidence in the news.

Consent and privacy laws: Point out opportunities for revisions to the provisions of the consent and privacy laws, particularly those regarding using a person's likeness when creating deepfake research. This means criminalizing the production of deepfakes without consent and imposing specific sanctions in most situations where the creation would be a form of abuse or slander.

Cooperation with Technology Platforms: Formulate and implement community standards to encourage and discourage deepfakes and other deceptive technologies, but in ways that do not facilitate technology platforms' collusion with governments.

Funding for Research and Development: Funding should be sought to develop deepfake detection technologies and establish deepfake ethical standards.

International Cooperation: Build public support for legislation and global collaboration to solve issues around deepfakes, which are global in scale so that the laws do not work against each other to be circumvented.

6.1.1 Public Engagement Strategies

Media Literacy Campaigns: Implement nationwide media literacy efforts to inform the public about deepfakes, their dangers, and how to scrutinize online content. That may be workshops, online courses, or information.

Partnerships with Educational Institutions: Partner with schools and universities to offer deepfake education in the school curriculum, including critical thinking, digital literacy, and morality of media consumption.

Community Workshops and Forums: Create public workshops and public forums to gather the public around what deepfake technology means in an open forum where experiences related to fake news and digital trust can be shared.

Engagement with Vulnerable Populations: Implement individual outreach campaigns targeting vulnerable groups (youth, marginalized groups) to inform them of the specific dangers of deepfakes and to offer support tools.

Utilization of social media: Use social media to share content related to deepfakes and use visual content (e.g., video, infographic) to reach a broader audience and encourage sharing.

6.1.2 Impact Assessment Tools

Development of Metrics and Indicators: Standardize metrics and indicators to assess how Deepfake impacts society in areas such as trust, mental health, and disinformation.

Longitudinal Studies: Conduct longitudinal research on how perceptions and actions toward deepfakes vary yearly for the benefit of policymakers and researchers.

Surveys and Public Opinion Polls: Conduct frequent public opinion polls to assess the knowledge, awareness, and perception regarding deepfake technology to guide the education and policy campaigns that will follow.

Case Study Analysis: A case study repository should be developed to track how deepfake incidents harm and positively affect people and communities and guide policymakers in adopting best practices.

Collaboration with Research Institutions: Closer collaboration with academic and research organizations will help create multidimensional impact assessments for implementation across various sectors impacted by deepfake technology, such as media, education, and mental health.

By implementing these recommendations, stakeholders can better navigate the challenges posed by deepfake technology while promoting a more informed and resilient society.

6.1.3 Conclusion

The exploration of deepfake technology through the lens of CLA uncovered a complex relationship between innovation and societal impact, highlighting its applications, the significant risks, and the potential benefits associated. The advancement in deepfake causes more multifaceted societal challenges, including but not limited to the erosion of trust in digital media propagandizing geo-political tensions, the spread of misinformation stimulating anarchic chaos, and psychological effects on individuals triggering death. However, it also offers opportunities for creative applications in fields such as education and entertainment, highlighting the dual nature of technological advancements. The findings of this study emphasize the urgent need for proactive measures, including enhanced media literacy, regulatory frameworks, and collaborative efforts among policymakers, technology developers, and educators. By fostering critical thinking skills and promoting responsible use of deepfake technology, society can better navigate the complexities of the digital landscape. Future research should focus on developing effective prevention methods and detection methods, conducting longitudinal studies to assess the long-term impacts of deepfakes, and implementing public awareness campaigns to mitigate negative consequences. Ultimately, a balanced narrative that recognizes both the potential benefits and inherent risks of deepfake technology is essential for shaping a resilient society capable of harnessing its power while safeguarding against misuse. As we move forward, engaging in ongoing dialogue and research is crucial to ensure that technological advancements serve the greater good.

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